Scientific Inquiry

3-1 The student will demonstrate an understanding of scientific inquiry, including the processes, skills, and mathematical thinking necessary to conduct a simple scientific investigation.

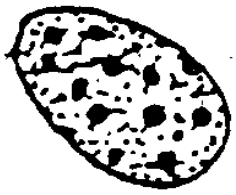
3.1.1 Classify objects by two of their properties (attributes).
Taxonomy Level: 2.3-B Understand Conceptual Knowledge

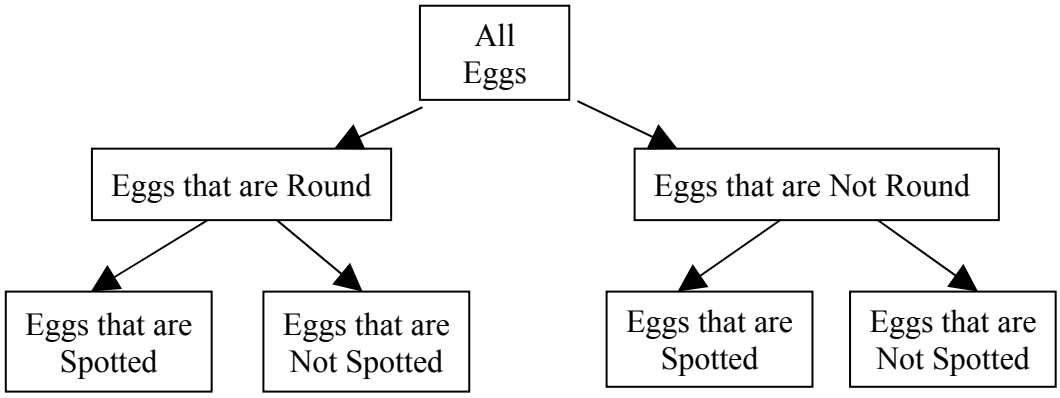
Previous/Future knowledge: In kindergarten, students compared objects by using nonstandard units of measurement (K-1.4), and classified objects by observable properties (including size, color, shape, magnetic attraction, heaviness, texture, and the ability to float in water) (K-5.1). In 1st grade (1-1.1), students compared, classified, and sequenced objects by number, shape, texture, size, color, and motion, using standard English units of measurement where appropriate. In 6th grade (6-1.3), students will classify organisms, objects, and materials according to their physical characteristics by using a dichotomous key.

It is essential for students to classify objects by two *properties*, or attributes, so that similarities and differences can be observed between objects. To classify by two properties,

- First, observe the objects.
- Find out what properties they have that are the same and what they have that are different.
- Choose one property.
- Classify all objects into two groups based on one property—the objects either have the property (group 1) or they do not (group 2).
- Next, take all the objects in group 1 and classify them into two smaller groups based on a second property.
- Then, take all the objects in group 2 and classify them into two smaller groups based on a second property.
- The second property used to further classify the groups does not have to be the same for each of the groups.

For example, to determine the group to which the egg belongs based on its properties, use the following diagram:





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It is not essential for students to classify observations as either quantitative or qualitative. Students do not need to know how to create or use a dichotomous key to identify an unknown object.

Assessment Guidelines:
The objective of this indicator is to *classify* objects by two of their properties; therefore, the primary focus of assessment should be to categorize objects by two attributes. However, appropriate assessments should also require students to *identify* the properties by which an object was grouped; *compare* groups to determine similarities and differences; or *explain* why an object was placed into a particular group.